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A REVISION OF THE VERNAL SPECIES OF
HELENIUM (COMPOSITAE)

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(continued from p. 178)

To complete the confusion, since 1874 both *Galardia fimbriata* Michx. and *Leptopoda fimbriata* T. & G. have often been considered to be the same taxon, despite the inadequate understanding of either the nomenclatural or taxonomic complexities surrounding both of the binomials. This has led to a confused application of both Wood's *H. fimbriatum* and Gray's *H. fimbriatum* to various taxa to be found from the Carolinas to Texas. Moreover, the parenthetical author has been variously cited as either Michaux or Torrey and Gray or else left out completely. Nevertheless, the taxon described by Torrey and Gray as *Leptopoda fimbriata* is recognized here as a distinct species and that this species is not the same as either of the two elements (*H. vernale* and *H. pinnatifidum*) included within *Galardia fimbriata* Michx.

There appears, then, to be only one course of action possible under the provisions of the rules and preamble of the present Code. This course of action is to invoke the application of Article 65 by which an ambiguous name must be rejected. Therefore the name *Helenium fimbriatum* is hereby rejected from use for this species. In order to avoid further confusion and inasmuch as Thomas Drummond was the first person to collect this plant, the epithet *Drummondii* has been chosen to form the new name *Helenium Drummondii* for this species.

Helenium Drummondii is most likely to be confused, upon superficial examination, with *Helenium vernale*. The character of the pappus, however, is sufficient to result in a ready separation of the two. In *H. Drummondii* it is usually longer and always distinctively slashed into a multitude of *fimbriae*, the *fimbriae*

forming over one-half the body of the scale and being crimped or crinkled. The hairy-pubescent achenes, the longer and narrower ray corollas and the lanulose pubescence at the top of the peduncle in *H. Drummondii* reinforce the distinction between the two. *Helenium Drummondii* may be distinguished from *H. pinnatifidum* on the basis of the more-decurrent cauline leaves, the petioloid radical leaves, the longer and narrower ray corollas and the characters of the pappus scales.

The two specimens of this species reputedly from Florida pose a distributional problem in that all the other specimens of this species are either from Texas or western Louisiana. There is no definite locality given for these two specimens other than "Florida" or "East Florida." In addition, as far as this study has revealed, this species has not been collected in Florida apart from these two specimens nor since 1876. As near as can be determined, the two specimens belong to the taxon *H. Drummondii* and there is no reason for considering them as otherwise. They may possibly represent a "lost" element of the Floridian flora that is now either extinct or very highly restricted in distribution so as not to have been re-collected.

However, at the Gray Herbarium there is a specimen of this species which was collected by Leavenworth in Texas "near the Salina [or Sabine]." This specimen is the syntype of *Leptopoda fimbriata* T. & G. that was acknowledged by Torrey and Gray to be from Texas. It seems highly probable that the syntype collection by Leavenworth from East Florida represents a mislabeling as to locality of collection, and may well be a duplicate collection of the one made in Texas.

The specimen collected by Mary Treat is not so easily explained or dismissed for there is no indication that she ever was in Texas or Louisiana collecting plants. In this particular case, it may well be that the Treat collection is the result of a chance introduction of *H. Drummondii* to the eastern coast of Florida and Mrs. Treat happened to be there one late winter to collect it. A more extreme possibility is that these two specimens represent a second origination of *Helenium Drummondii* from either *H. vernale* or *H. pinnatifidum* in the eastern part of Florida and are not directly related to *H. Drummondii* of Texas and Louisiana.

4. *Helenium brevifolium* (Nutt.) A. Wood

Leptopoda brevifolia Nutt. Trans. Am. Phil. Soc. ser. 2. 7: 373. 1841. Syntype: collected by DeSchweinitz, Yadkin (PH). Syntype (BM—not seen).

Leptopoda brevifolia Nutt. var. β T. & G. Fl. N. A. 2: 387. 1842. Lectotype: "*Leptopoda ? integrifolia, L. brevifolia* Nutt., Raleigh, N. C., M. A. Curtis" (NY).

Helenium brevifolium (Nutt.) A. Wood, Am. Bot. & Fl. 182. 1870.

Helenium brevifolium (Nutt.) A. Gray, Proc. Am. Acad. Arts & Sci. 9: 205. 1874. Superfluous name repeating the combination of A. Wood.

Helenium Curtisii A. Gray, Proc. Am. Acad. Arts & Sci. 9: 204. 1874. Lectotype: "*Leptopoda brevifolia*, Raleigh, N. C., M. A. Curtis" (GH).

Heleniastrum brevifolium (A. Gray) O. Ktze. Rev. Gen. (pt. 1) 342. 1891.

Heleniastrum Curtisii (A. Gray) O. Ktze. Rev. Gen. (pt. 1) 342. 1891.

Helenium integrifolium Mohr, Contrib. Nat. Herb. 6: 811. (1901) non Sesse & Moc. Fl. Mex. 189. 1894.

Perennial herb, the stem developing from a rosette formed the previous season from the seedling or as an offset from the short caudex; caudex with coarsely fibrous roots and often with the persistent fibrous leaf bases of prior rosettes. Plant erect, (2.2–) 3.2–7.2 (–10.0) dm. high, single-stemmed, often occurring in clusters, *branched, each branch bearing but a single head*. While the growth is of a determinate type, with a head terminating each branch and the successive branches developing from the upper leaf axils, the over-all pattern of the branching system is of the type commonly referred to as "*corymbosely branched*." Heads 1–4 in number, the larger number occurring on the more robust plants. Stems sulcate, glabrous and often anthocyanaceous below, becoming increasingly striate above. Peduncle striate, lanulose below, becoming increasingly pubescent upwards *so as to be lanose to tomentose at the base of the involucre in extreme cases*. Lateral peduncles increasing in length with a decreased position on the stem, often over-topping the terminal or central peduncle. Peduncles not noticeably enlarged or fistulous beneath the involucre. Leaves, except for the uppermost ones, glabrous, uni-nerved with the lateral nerves obscured, impressed-punctate, resin-atomiferous, gradually reduced upwards in the more robust plants, but often appearing scapose in the more depauperate plants. Radical leaves obovate, spathulate to oblanceolate, usually intact and present; margin entire, repand, scalloped, scalloped-denticulate to shallowly incised; apex obtuse to more or less acute; *the basal portion tapering to form a petioloid structure*, enlarging again within the rosette so as to be somewhat clasping; (2.5–) 4.0–10.5 (–18.0) cm. long, (0.8–) 1.2–2.0 (–2.5) cm. wide. Cauline leaves becoming reduced in size and more spathulate to linear-lanceolate; margin somewhat denticulate; bases decurrent along the stem so as to form a manifest wing. The uppermost bracts are often lanulose, especially toward the base where the axil is often arachnoid-pubescent along with the adjacent stem portions. Developing buds usually quite tomentose but becoming

decreasingly so with age and development. Involucre biseriate, the outer series exceeding the inner; phyllaries linear-lanceolate, 4.0–6.0 mm. long, 1.0–2.0 mm. wide at the base, pubescent, acuminate, becoming withered and reflexed or not reflexed with age. Heads convex to mostly hemispherical, 1.2–2.0 cm. wide, 1.0–1.5 cm. high; receptacle convex to subglobose. Ray florets neutral; ligules yellow, 1.5–1.9 cm. long, pubescent below, broadly cuneate, 3–4-fid at the apex, resin-atomiferous; achenes abortive and less than those of the disk in size. *Disk brown*, decidedly so to sometimes only faintly, especially in dried specimens when it then appears to be a sordid-yellow. Disk florets fertile; corollas pentamerous, 3.0–5.0 mm. long, the lobes pubescent-glandular and red-purple to red brown in color, resin-atomiferous, and with a short basal tube; pappus scales *obovate, somewhat clawed as a rule*, verging to oblanceolate, obtuse, (1.0–) 1.5 (–2.0) mm. long, the margin more or less entire, 5–10 in number; *achenes hairy-pubescent* on the ribs, resin-atomiferous, 1.0–1.5 mm. long, columnar to truncate-turbinate in shape.

DISTRIBUTION: Plants of scattered localities in the Southeastern United States; occurring in upland bogs, swamps and wet depressions in the inner Piedmont-lower Appalachian provinces of North Carolina, Georgia and Alabama, Coastal Plain-like habitats of the Piedmont of North Carolina and Alabama such as *Sarracenia*-type bogs, wet pine woods and wet meadows, as well as in the Coastal Plain proper of southeastern Virginia, southeastern North Carolina, the western part of the panhandle of Florida, and Alabama, Mississippi and Louisiana in such habitats as wet pine barrens, *Sarracenia* bogs, shrub-bogs, margins of ponds, swamps and wet ditches. (Map 2)

REPRESENTATIVE SPECIMENS.—**Louisiana.** St. Tammany Parish: Slidell, 2 April 1887, *Joor s.n.* (NO). **Mississippi.** Harrison Co.: near Biloxi, *Perkins & Hall 2845* (POM). Jackson Co.: Ocean Springs, April 1892, *Skehan s.n.* (DUKE, GH, IA, MO, NCU, SMU, WIS). **Alabama.** Baldwin Co.: Point Clear, Rte. 98, S. of Fairhope, *Hood 4518* (FLAS). Cherokee Co.: about 2 m. NE. of Center, *Harper 91* (GH, MO, NY). Cullman Co.: about 4 m. ENE. of Cullman, *Harper 3724* (GH, MICH, MO, PH, US). Escambia Co.: Flomaton, *Bilt. Herb. distrib. 9588a* (GH, MIN, NCU, POM). Lee Co.: Auburn, 9 May 1896, *Earle & Underwood s.n.* (NY). Mobile Co.: Mobile, 26 April 1898, *Baker s.n.* (F, NY, POM). Russell Co.: near Fort Mitchell, *Harper 2* (GH, MO, NY, PH). Washington Co.: 3.8 m. NW. of Citronelle, *Cory 58563* (NCSC, SMU). **Florida.** Escambia Co.: Ensley, *Goodale 69874* (GH). Okaloosa Co.: 6 m. NW. of Fort Walton, *Tyson 583* (FLAS). Santa Rosa Co.: Milton, *Fassett 21170* (MIN, WIS). Walton Co.: DeFuniack Springs, *Curtiss 6383* (BKL, F, GH, MIN, NY, UC, US). Washington Co.: 10 m. N. of Ebro, Rte. 79, *Hood 1678* (FLAS). **Georgia.** Douglas Co.: 1.3 m. W. of Villa Rica, *McDowell & Venard 579* (DUKE). Meriwether Co.: Peters, *Twomey s.n.* (PH). **North Carolina.** Brunswick Co.: near Maco, along Rte. 74-76, *Godfrey & Weibe 50368* (DUKE, GH, NCSC, SMU, WS). Catawba Co.: N. of Hickory, *Small & Heller 447* (F, MO, NY, PENN, PH, UC, US). Henderson Co.: East Flat Rock, *Correll, Blomquist & Garren 5145* (DUKE). Iredell Co.: 3.2 m. W. of Harmony, *Radford 2655* (NCU). New Hanover Co.: Wilmington, *M. A. Curtis s.n.* (PH). Wake Co.: sphagnous bog at Method, Raleigh, *Godfrey 3974* (NCSC, NCU, NY).

Virginia. Greensville Co.: N. of Dahlia, *Fernald & Long 10051* (F, GH, MO, NY, US). James City Co.: about 3 m. W. of Williamsburg, *Baldwin, Jr. 14861* (DUKE, MO, NCSC, NY, US).

In the *North American Flora* Torrey and Gray established a variety within this taxon, variety β , a reputedly very local endemic from the vicinity of Raleigh, North Carolina. The variety differed from the more typical part of the species in that it was more robust, *i.e.* "stem stouter and taller; leaves larger; the cauline more strongly decurrent." Asa Gray, 32 years later, elevated the variety to specific status using the name *Helenium Curtisii* and added as diagnostic characters for the separation of the two, the distinction that *H. Curtisii* had an ovate-conical receptacle and that the disk was subglobose. This was in contra-distinction to the barely hemispherical receptacle and convex disk of *H. brevifolium*.

The present study could not validate the characters adduced by Torrey and/or Gray for the separation of these two taxa, *Helenium brevifolium* and *Helenium Curtisii*, except to the extent that in the same population some of the plants are more robust than some of the others. Consequently, no formal taxonomic recognition is given in this treatment to *Helenium Curtisii* as a taxon apart from *Helenium brevifolium*.

Unfortunately it is no longer possible to collect "*Curtisii*" at the type locality. In the late spring of 1955 the author made a trip to the vicinity in an effort to relocate it. The type locality was known by hearsay to be a bog just outside of Raleigh, close by Meridith College in a suburban area known as Method. Several boggy spots were located, including a known Coastal Plain-like one containing *Sarracenia flava* but not "*H. Curtisii*." On a second trip, the correct location, as far as it could be determined, was finally located and the reason for the difficulty in finding it was apparent. Where once had been a sphagnous bog with Coastal Plain-like aspects was now a paved street with two rows of half-completed houses on each side. The type locality, with whatever "*Curtisii*" that might have persisted through the years, had been bull-dozed from existence. All that remained of the bog were some springy places in the new back-yards of the houses.

Several other locations are now known in North Carolina,

however, and in Virginia where *Helenium brevifolium* occurs. Specimens collected from these populations have been identified and accepted as "*Curtisii*" in the past. Indeed, it takes no imagination or struggling with the keys to identify many of the specimens of *H. brevifolium* from the Coastal Plain of Florida, Alabama, Mississippi and North Carolina as "*Curtisii*" while duplicates of the same collections pass as *H. brevifolium*. The author has visited three of these locations in Iredell Co., N. C. and has had the advantage of observing the "*Curtisii*" element in the field and making mass collections. If, in the field, one were to collect along a line-transect through one of the boggy areas that is somewhat open and subject to seasonal drying-out in the late spring and early summer, the relationship of these two elements, *H. brevifolium* and "*Curtisii*" is clearly seen. Those plants from the outer, drier edges of the bog would be identified as *H. brevifolium*. The plants from the center of the bog, where the water is more plentiful and present for the longest period of time, however, would be identified as "*Curtisii*." Those plants from the far side of the bog, where a drier area is again encountered, would in turn be identified, once more, as *H. brevifolium*. Those plants from between the center and the outer edges, as well as those from tussock portions of the bog, grade off from the aspect of *brevifolium* to that of "*Curtisii*." In those bogs where the water is plentiful all season, more of the plants would be identified as "*Curtisii*" than not, especially from those bogs that are deep in ravines and shaded by overhead hardwoods. It would appear, then, that the "*Curtisii*" element is no more than a growth form of *H. brevifolium* induced by highly mesophytic conditions.

Helenium brevifolium is easily distinguished from *H. pinnatifidum*, *H. vernale* and *H. Drummondii* on the basis of the following characters:

1. the red-brown tipped disk florets so that the disk is red-brown colored
2. the corymbose branching habit, with the branches terminated by a single head
3. the obovate and more or less clawed pappus scales.

Helenium brevifolium can, in turn, be distinguished from the other taxon with which it might be confused, *H. campestre*, on the basis of:

1. the achene is hairy-pubescent rather than puberulent
2. the pappus scales are twice as long, 1 mm. long or more in contrast to 0.5 mm
3. the stem and foliage, excepting the uppermost, are glabrous
4. the radical leaves are petioloid.

5. *Helenium campestre* Small

Helenium campestre Small, Fl. SE. U. S., 1291. 1903. Holotype: Collected by Dr. Hasse, 25 May 1885, Little Rock, Pulaski Co., Arkansas (NY).

Perennial herb, the stem developing from a basal rosette formed the previous season from the seedling or as an offset from the short caudex; caudex with coarsely fibrous roots and often with the persistent fibrous leaf bases of prior rosettes. Plant erect, 4.0–6.7 dm. high, single-stemmed, branched, each branch usually bearing but a single head, though in the more robust plants the branches are sometimes bifid toward the apex and thus bearing two heads. While the growth is of a determinate type, with a head terminating each branch and the successive branches arising from the upper leaf axils, the over-all pattern of the inflorescence is of the type commonly termed *corymbosely branched*. Heads 1–8 in number, the more robust plants with the greater number, and usually quite showy by virtue of the large rays. Stems sulcate, winged and *noticeably hirsute below*, becoming striate and finely pubescent above. Peduncles striate, becoming densely pubescent above, lateral ones becoming longer with descending position on the stem, usually equal to the central one, and becoming enlarged and fistulous beneath the involucre. *Leaves decidedly hairy-pubescent*, uninerved with the lateral nerves obscured, impressed-punctate, resin-atomiferous, becoming gradually reduced upwards. Radical leaves obovate, spatulate, oblanceolate, to elliptic-lanceolate, usually intact and present; margin entire to repand, occasionally scalloped or pinnatifid-incised; apex obtuse; *the basal portion not petioloid* but gradually tapered and becoming enlarged again within the rosette so as to be somewhat clasping; 3.5–7.0 cm. long, 0.5–1.7 cm. wide. Cauline leaves becoming reduced upwards; not petioloid; bases decurrent along the stem so as to manifest a wing; oblanceolate, elliptic-lanceolate to linear-lanceolate; margin entire to repand, the uppermost bracteate ones occasionally somewhat denticulate; apex acute to slightly acuminate; base gradually tapered to the wing; usually less coarsely pubescent than the basal leaves. Involucre biseriate, the outer series exceeding the inner; less deeply parted than in preceding taxa so as to form a slight cupule at the base; phyllaries linear-lanceolate, 5.0–6.5 mm. long, 1.5–2.0 (–3.5) mm. wide at the base, pubescent, acute to acuminate, becoming more or less reflexed ultimately. Heads mostly hemispherical to subglobose, 0.8–1.5 cm. high, 1.0–2.0 cm. wide; receptacle mostly subglobose though often hemispherical. Ray florets neutral; ligules yellow, prominent and showy, resin-atomiferous and pubescent below, 1.5–2.5 cm. long; achenes abortive and less than those of the disk in length. *Disk brown*; disk

florets fertile; corollas 3.0–4.5 mm. long, brown-tipped on the lobes, glandular-pubescent on the lobes, pentamerous, resin-atomiferous, cylindrical to cylindrical-campanulate in outline with a short basal tube; *pappus* obovate to suborbicular, not clawed, 5–10 in number, 0.4–0.5 mm. long, obtuse at the apex, margin entire to erose; achenes *puberulent* on the ribs, resin-atomiferous, 1.0–1.5 mm. long, columnar to truncate-turbinate in shape.

DISTRIBUTION: KNOWN only from seven counties of eastern Arkansas, between the Ouachita Mountains and the Mississippi Alluvial Plain; occurring in low open pinewoods, fertile bottoms, flatwoods, wet pine-lands, rocky open woods, river bottoms, ridge thickets and moist places in prairies. (MAP 2)

REPRESENTATIVE SPECIMENS.—Arkansas. Drew Co.: Wilmar, *Demaree* 15057 (F, GH, MIN, MO, NY). Faulkner Co.: near Conway, *Palmer* 27110 (MO, UARK). Independence Co.: Batesville, *Demaree* 26766 (OKLA, SMU, TEX). Prairie Co.: Grand Prairie near Hazen, *Palmer* 25064 (GH, NY). Pulaski Co.: base of Maumelle Mountain near Pinnacle, *Palmer* 22993 (F, MO, UARK). St. Francis Co.: Forrest City, *Demaree* 15116 (F). White Co.: W. Bradford, *Moore* 450469 (UARK).

Until this species was recognized as being distinct by J. K. Small, it had been confused most often with *Helenium flexuosum* Raf. (*H. nudiflorum* Nutt.). It can be distinguished at a glance by the corymbose branching habit and the small number of large heads in contrast to the paniculate branching and large number of small heads of *H. flexuosum*. The characters by which *H. campestre* may be distinguished from *H. brevifolium* have been pointed out under the treatment of the latter. While *H. campestre* has been most often confused with *H. flexuosum*, its closest affinity appears to be with *H. brevifolium*. Much of the discussion related to this taxon has already been brought out in relation with that of *H. brevifolium* and *H. campestre* in the portion of this paper devoted to relationships.

6. *Helenium flexuosum* Raf.

Helenium flexuosum Raf. New Fl. N. A. (pt. 4): 81. 1838. Neotype: Collected by Mary and Emily Mohr, Aug. 1884, Terre Haute, Vigo County, Indiana (US); original type locality ascribed by Rafinesque was the "River Wabash."

Helenium dichotomum Raf. New Fl. N. A. (pt. 4): 81. 1838.

Helenium nudiflorum Nutt. Trans. Am. Phil. Soc. ser. 2. 7: 384. 1841. Syntype: "*Helenium*nudiflorum* (Nutt.) Ark." (PH); Syntype: "*Helenium*nudiflorum*, Red River" collected by Nuttall, ex herb. Elias Durand (GH); Syntype: (BM—not seen).

Helenium micranthum Nutt. Trans. Am. Phil. Soc. ser. 2. 7: 385. 1841. No type material located.

Leptopoda brachypoda T. & G. Fl. N. A. 2: 388. 1842. Lectotype: Collected in Louisiana, Aug. 1840, by Dr. Hale (NY).

Leptopoda brachypoda T. & G. var. β . T. & G. Fl. N. A. 2: 388. 1842. Lectotype: Collected in Louisiana by Dr. Leavenworth (NY).

Helenium atropurpureum Kth. & Bouché, Ind. Sem. Hort. Berol. Anno 1845 Collectorum 12. 1845. Type: original description; cultivar.

Helenium atropurpureum Kth. & Bouché var. *grandicephalum* LeMaire, L'ill. Hort. 10: 375. 1863. Type: illustration and original description; cultivar.

Helenium seminariense Featherman, Rep. So. & Cent. La. 1870, Fl. Ludov. 74. 1871. Lectotype: "Helenium seminariense" (GH).

Helenium brachypoda (T. & G.) A. Wood, Am. Bot. & Fl. 182. 1870.

Helenium nudiflorum Nutt. var. *purpurea* Hale ex. A. Gray, Proc. Am. Acad. Arts & Sci. 9: 203. 1874. Type: the same as *L. brachypoda* T. & G. var. β . T. & G.

Heleniastrum nudiflorum (Nutt.) O. Ktze. Rev. Gen. (pt. 1) 342. 1891.

Helenium polyphyllum Small, Fl. SE. U. S. 1291. 1903. Holotype: Collected by S. M. Bain, no. 77, Sept. 1892. Jackson, Madison County, Tenn. (NY); isotype (?), (US).

Helenium Godfreyi Fern. RHODORA 45: 494. 1943. Holotype: Collected by Godfrey & Tryon, no. 586, 14 July 1939, Pineville, Berkeley County, S. C. (GH); isotypes (NY, UC, US).

Helenium floridanum Fern. RHODORA 45: 494. 1943. Holotype: Collected by A. H. Curtiss, no. 6663, Fitzgerald, Hernando County, Fla. (GH); isotypes (BKL, MIN, MO, NY, UC, US); var. *aphanactis* on the label of *Curtiss 6663* is an unpublished name.

Perennial herb, stem developing from a rosette formed the previous season from the seedling or as an offset from the short caudex; caudex with coarsely fibrous roots and often with the persistent fibrous leaf bases of prior rosettes. Plant erect, 0.3–1.0 m. high, single-stemmed, usually *profusely branched*, each branch bearing several small heads and quite often bifid toward the apex. While the growth is of a determinate type, with each branch terminated by a head, the successive branches develop basipetally from the upper leaf axils, and while the heads are formed in a like manner on each branch, the over-all pattern of the inflorescence is of the type commonly termed *paniculately-branched*. Heads usually very many, with the depauperate plants having fewer in number, rarely reduced to one. Stems sulcate, *pubescent*, winged below, becoming striate and more broadly winged above and within the branching portion, with the wings sometimes over 5 mm. wide and the pubescence usually becoming more fine and incurved. Peduncles striate, *with short incurved pubescence*, more or less uniform in length and becoming enlarged at the base of the involucre and fistulous, especially at maturity. *Leaves with various degrees of pubescence below*, ranging from glabrate to rather densely hairy, the upper leaves usually pubescent with short and somewhat incurved hairs. Leaves prominently uninerved, lateral nerves obscure, impressed-punctate, resin-atomiferous, gradually reduced upwards. Radical leaves linear-lanceolate, elliptic-lanceolate, oblanceolate to

spathulate, usually intact and present on those plants collected early in the season only; margin ranging from entire to pinnatifid-incised; apex obtuse to acute, the basal portion tapering somewhat but *not petioloid*, re-expanding within the rosette so as to be somewhat clasping; 3.0–21.0 cm. long, 0.4–3.0 cm. wide. Cauline leaves becoming reduced upwards, becoming more linear-lanceolate upwards, *not petioloid*, but decurrent along the stem so as to form a manifest wing; lower ones denticulate, but soon becoming entire; the upper bracteate leaves lanceolate to linear-lanceolate, entire decurrent, more remote and often with extremely reduced bracts scattered along the peduncle. Involucre biseriate, the outer series exceeding the inner one and not so deeply parted, forming a slight cupule at the base; phyllaries linear-lanceolate, pubescent, acute to acuminate, becoming reflexed including the cupule-like portion of the base at anthesis, 0.4–0.7 cm. long, 1.0–2.0 mm. wide at the base. *Heads subglobose to globose*; occasionally somewhat conic; receptacle subglobose to decidedly conical. Ray florets neutral; ligules yellow, umber, suffused with red or deep purple or ligules absent entirely in some plants, resinatomiferous, pubescent below, 1.0–2.1 cm. long; achenes abortive and less than those of the disk in length. *Disk red-brown to red-purple in color*, 0.7–2.0 cm. wide, 0.5–1.5 cm. high; disk florets fertile; corolla 2–3.0 mm. long, glandular-pubescent on the lobes, *predominantly 4-merous (both lobes and stamens)*, red-brown to red-purple tipped, cylindric to cylindric-campanulate in shape with a short basal tube, resinatomiferous; pappus scales 5 (–8) in number, rigid, *lanceolate*, usually *acute* at the apex so as to form an *awn*, *the costa more or less manifest*, margins serrate to a degree, 0.4–1.5 mm. long; achenes hairy-pubescent on the ribs, resinatomiferous, 1.0–1.5 mm. long, columnar to truncate-turbinate in shape.

DISTRIBUTION: Plants of various provinces of the eastern United States, from just east of the Great Plains to the eastern seaboard; a weedy plant apparently extending its range northward and eastward and seemingly capable of survival in a variety of habitats; occurring in prairies, flatwoods, pine barrens, borders of ponds and stream banks, low moist woods, open areas of the Appalachians, savannahs, pocosin margins, roadsides, old fields and moist low meadows and roadside ditches; from eastern Texas northward into Missouri and Illinois and thence eastward to the Atlantic seaboard, Florida to Maine. (MAP 3)

REPRESENTATIVE SPECIMENS.—**Texas.** Bowie Co.: 3 m. W. of Noah, *Cory 56009* (NDA, OKLA, SMU, US, WS). Jasper Co.: 8 m. S. of Kirbyville, *Shinners 7675* (ARIZ, GH, SMU, UC). **Arkansas.** Garland Co.: Hot Springs, 5 Aug. 1879, *Letterman s.n.* (BKL, F, MIN, MO, NY, PH, TEX, UARK, US). Leflore Co.: near Page, *Blakely 1438* (DS, GH, MIN, MO, OKLA, US). **Oklahoma.** Adair Co.: 6 m. S. of Ballard, *Waterfall 10194* (ARIZ, OKLA, RSA, SMU, TAES). **Missouri.** Ripley Co.: Pleasant Grove, *MacKenzie 242* (COLO, F, MIN, MO, NY, PH, RM, US). **Tennessee.** Obion Co.: near Walnut Log, Reelfoot Lake, *Eyles & Eyles 131* (FLAS, GH, MO, NY, OKL, OKLA, OSC, PENN, TENN, REX, UC, WIS, WS, WVA). **Kentucky.** Lyon Co.: Kuttawa, *Eggleston 5179* (GH, MIN, MO, NY). **Illinois.** Clinton Co.: Carlyle, *Buckley s.n.* (GH, NY). **Indiana.** Morgan Co.: Sycamore Creek, *Friesner 14816* (DUKE, GA, GH, NY, UC, WS, WVAS).

Switzerland Co.: 1.2 m. E. of Fairview, *Friesner 23581* (FLAS, NCSC, SMU, TEX). **West Virginia.** Upshur Co.: Sago, 15 Aug. 1947, *Grose & Grose s.n.* (FLAS, GA, GH, IA, NCSC, OKLA, OSC, PENN, SMU, TEX, UC, WS, WVA). **Louisiana.** Rapides Parish: vicinity of Alexander, *Ball 506* (F, GH, MIN, MO, NY, US). **Mississippi.** No county indicated or determinable: Westfield, *Tracy 8669* (F, GH, MIN, MO, NY, PENN, TAES, US, WIS). **Florida.** Duval Co.: Jacksonville, *Lighthipe 559* (BKL, GH, MIN, NDA, NY, RM, WIS). Hillsborough Co.: Tampa, *Curtiss 1520* (BKL, F, IA, MIN, NCSC, NY, PH, US). **Georgia.** Rabun Co.: Tally Mtn. Creek, *Duncan 10139* (FLAS, GA, GH, IA, MIN, MO, NCSC, NDA, SMU, TEX, UC). **South Carolina.** Georgetown Co.: 4 m. W. of Georgetown, *Godfrey & Tryon 124* (DUKE, F, GH, NY, PENN, TENN, UC, US). **North Carolina.** Hertford Co.: 2 m. N. of Murfreesboro, *Godfrey & Fox 49667* (DUKE, GH, MIN, WS). Macon Co.: Horse Cove, near Highlands, *Godfrey 51366* (MIN, NY, OKL, OKLA, PENN, SMU, TEX, UC). **Virginia.** Greensville Co.: NE. of Emporia, *Fernald & Long 10451* (GH, NY). **Pennsylvania.** Chester Co.: 1¼ m. S. of Ercildoun, *Fogg 5760* (GH, PENN, TENN). **New Jersey.** Burlington Co.: 1½ m. E. of Red Lion, *Fogg 9137* (PENN). **New York.** Westchester Co.: Tibbet Brook Park, Yonkers, *Monachino 104* (BKL, DUKE, TENN, NY). **Connecticut.** Middlesex Co.: Killingworth, *Weatherby 5438* (NEBC). **Massachusetts.** Berkshire Co.: Great Barrington, 20 July 1920, *Hoffman s.n.* (NEBC). Plymouth Co.: Duxbury, 6 Oct. 1902, *Bond s.n.* (NEBC). **Vermont.** Windsor Co.: Woodstock, 27 Aug. 1938, *Kittredge s.n.* (GH, NEBC). **New Hampshire.** Carroll Co.: Wonalancet, Aug. 1914, *Terry s.n.* (NEBC). **Maine.** York Co.: N. Berwick, Aug. 1896 *Parlin s.n.* (MIN, NEBC).

In the *Synoptical Flora* of 1884, Asa Gray justly considered the applicable binomials extant at that time to be mere variants and treated *Helenium flexuosum* as a single, polymorphous species. Subsequent to Gray, three taxa have been segregated from *Helenium flexuosum* and described as new species. The first of these, *H. polyphyllum* Small, was given specific status purely on the basis that the upper branches were more widely winged (2 mm. wide or more) and that the plant was finely pubescent as opposed to puberulent and wings of the upper branches less than 2 mm. wide. Rydberg maintained Small's *H. polyphyllum* as a species co-existent with *H. flexuosum* in the more western and southwestern part of the latter's range, rather than as the Tennessee-Georgia endemic of Small. Fernald has rightly stated (*RHODORA* 45: 493. 1943) that both can be maintained as separate species: "Only by recognizing the smallest specimens with narrowest cauline wings as the former [*H. flexuosum*], the largest ones with the broadest wings as the latter [*H. polyphyllum*], ignoring the large series of transitional specimens . . ." Indeed, from the author's own experience of growing members of this taxon in the greenhouse, both forms of the wing occur in plants collected in the same

locality, plants that grew so close together in the wild that they probably originated from achenes shed from the same head. The author is convinced that very little value can be attached to "finely pubescent" in contrast to "puberulent" as a taxonomic character at the specific level in this variable species. On the basis then of the widespread series of intergrades as well as because these intergrades occur within the same colony of plants no taxonomic recognition is here afforded to *H. polyphyllum*.

Professor Fernald, after taking Rydberg to task for maintaining *H. polyphyllum* as distinct from *H. flexuosum*, proceeded to give specific status to two other forms of *H. flexuosum* that he considered worthy of such recognition (*RHODORA* 45: 494. 1943.) Fernald recognized these two, *H. Godfreyi* and *H. floridanum*, stating: "in our Southeast there are two extremes, native of low woods and swamps and evidently local endemics, which seem to be really well defined species."

Helenium Godfreyi was characterized as having blunt and awnless pappus scales, which also were either round or oval and from 0.4 to 1.4 mm. in length. In the formal latin diagnosis the achenes are described as "glabris verrucosis," and Plate 799 of the article in *Rhodora* contains an inset of the glabrous achene and pappus scales. In at least two of the isotypes of this binomial, however, the pappus scales are decidedly acute if not acuminate. Collections made by the author in the same area as the type locality of *H. Godfreyi* have shown upon examination that not only do both forms of the pappus scale, blunt and acute, occur in the same population but that some specimens had both forms within the same head. Similar collections from nearby counties in South Carolina and North Carolina all show that there is a tendency in these areas toward a blunt and awnless pappus in a number of the specimens. However, such a tendency has been witnessed in other populations of *H. flexuosum* well away from the Carolina Coastal Plain in Indiana, Missouri and Arkansas. Moreover, the more typical acute and awned pappus scale is encountered in specimens of *H. flexuosum* quite regularly from North and South Carolina.

Without actually destroying the utility of the type specimen,

a positive statement cannot be made but the author seriously doubts the existence of another glabrous achene within the heads of the type specimen. A few disk florets were removed from each head where it was possible to do so (8 heads in all) and there was not a single glabrous achene among those removed nor were there any in those of the isotypes examined.

Helenium floridanum "concentrated in the northern half of Florida" is distinguished from *H. flexuosum* according to Fernald by the "ovate pappus pales . . . rounded at tip and terminated by a very long, filiform and smoothish awn . . . [and] in this plant the relatively small heads are either rayless or with well developed ligules." Unfortunately, the pappus scale characters cited as being differential are in no way different from those of the pappus scales of specimens of *H. flexuosum* from Texas, Illinois, Mississippi, Pennsylvania or Maine. The "relatively small heads" is hardly of any taxonomic importance or descriptive specificity in distinguishing taxa within *H. flexuosum* proper. The head size is a variable character in this species, seemingly dependent to some degree on environmental conditions, even in the "northern half of Florida." The author suspects that the rayless condition of some of the specimens from Hillsborough and Hernando Counties, Florida prompted the publication of *H. floridanum* more than anything else. However, this rayless condition cannot be correlated with any other morphological character nor is it constant, there being specimens with some heads rayed and other heads rayless. In addition, the rayless character of some of the specimens of *H. flexuosum* occurs in other parts of the range of the species, notably Texas.

In this treatment, on the basis of the examination of over 1,500 specimens of *H. flexuosum* from Texas to Maine, no taxonomic recognition in a formal sense is given to *H. Godfreyi* and *H. floridanum* either within or apart from *H. flexuosum* and at most they are considered to represent population differences of relatively small importance within the species as a whole. Viewed throughout its entire geographical range, *H. flexuosum* is a rather variable taxon, especially in relation to the other members of the vernal group of species of *Helenium*. Such variability is not unexpected in a wide-ranging and weedy

species that presumably is not an apomict. The means by which *H. flexuosum* may be distinguished from the other vernal taxa, as well as speculations concerning its origin and history, have been pointed out and suggested in that part of this paper which discusses relationships and there remains no need for repeating them here.—GRAY HERBARIUM, AND ARNOLD ARBORETUM, HARVARD UNIVERSITY.

RANGE EXTENSIONS IN THE GENUS *PETERIA* (LEGUMINOSAE).¹
—Since the publication of my treatment of the genus *Peteria*,² several persons have been kind enough to call my attention to collections which I had not seen and which extended the range of two species as mapped in that paper, and to one additional collection of a third species. In order to amplify the previous treatment, the following notes are presented.

I am indebted to the following persons for the loan of the specimens cited: Dr. Rimo Bacigalupi, the Jepson Herbarium, University of California (JEPS); Dr. Ray J. Davis, the herbarium of Idaho State College (IDS); and Dr. William H. Baker, herbarium of the University of Idaho (ID).

Peteria Thompsonae S. Wats. This plant is known to have a range extending into southwestern Idaho, Owyhee County: Hot Springs, June 1, 1945, *Ripley & Barneby 6511* (IDS); 12 miles south of Bruneau, June 10, 1947, *J. H. Christ 16,715* (ID); 13 miles south of Bruneau, June 21, 1956, *W. H. Baker 14,023* (ID); Hot Springs Falls, June 27, 1953, *Sharp Tisdale, Fosberg, & Helle*, s.n. (ID).

Peteria scoparia A. Gray. Known from southwestern Colorado, Montezuma County: Mesa Verde, June 1875, *T. S. Brandegee 1103* (JEPS).

Peteria glandulosa (A. Gray) Rydb. An additional collection of this species has been seen: Esperanza, Puebla, Mexico, *C. A. Purpus 2474* (JEPS).—C. L. PORTER, UNIV. OF WYO., LARAMIE.

¹ Contribution from the Department of Botany and the Rocky Mountain Herbarium, University of Wyoming, No. 229.

² RHODORA 58: 344–354. 1956.